REMARKS

Claims 1-4, 6-10, 18-24 and 35 were in the case prior to this amendment. Claims 1, 3 and 4 have been amended above. Claims 1-4, 6-10, 18-24 and 35 remain in the case.

The Office Action

In the Office Action the Examiner objected to claim 1 (as then amended) because the word "are" was missing between the words "particles" and "made" in line 5 of the claim. The present amendment has mooted this objection.

The Examiner rejected claim 1 under 35 USC § 112, second paragraph. The Examiner found that "the entire surface" lacks antecedent basis and that "wherein the entire surface is coated with silver oxide" was indefinite because it might refer either to the surface of the particle or the surface of the polymer. Applicants respectfully submit that the amendments made above have mooted these rejections.

Rejections under 35 USC § 112

The Examiner also made new claim rejections under 35 USC § 112, first paragraph on the grounds that the specification did not convey to one of ordinary skill in the art that the inventors were in possession of the claimed invention. Essentially, the Examiner considered the limitation "entire surface" (indicating that surface of the particle was of silver oxide or ionic silver and not metallic silver) to be unsupported by the specification. The Examiner concluded that "[t]here is no guidance in the specification to select coat the entire surface of the metallic silver with silver oxide." The Examiner apparently contends that one of ordinary skill in the art would not understand that the specification describes the particle as having a coating of silver oxide. Applicants respectfully disagree with the Examiner's contention and traverse the rejection. Applicants do agree that the precise wording "entire surface" is not present in the specification. However, Applicants are confident that one of ordinary skill in the art

would have no difficulty in concluding that the entire surface of the particle is coated with ionic silver, that is, silver oxide.

The Examiner correctly points out that paragraph 34 indicates that there is "a coating of silver oxide" and that paragraph 59 indicates that there is "a surface coating". But the Examiner then contends that this description does not indicate that the entire surface is coated. In fact, as will be discussed below, there is other descriptive language in the specification that makes it clear that the metallic core of the particle is coated so that the surface is ionic (oxide) rather than metal. This notwithstanding, Applicants respectfully contend that it is not necessary to even refer to that language. When confronted with a description that states a particle is coated one could possibly envision two situations. Either the particle is entirely coated so that the surface is covered by the coating material thus hiding the particle core or else the particle is discontinuously coated so that the coating contains holes or openings which expose the particle core. It cannot be argued that the usual meaning of "coating" is a layer of one substance spread over another. For a moment let us consider the statement: "Melts in your mouth, not in your hand." One of ordinary skill in the art [of consuming candy] would recognizing that the hard candy coating on each M&M prevents the chocolate center from melting all over one's hands. There is no question of the coating being discontinuous. One of ordinary skill would recognize that the word "coating" defines a continuous coating unless discontinuities are specified. That is to say, Applicants respectfully submit that the default meaning of "coating of silver oxide" is a continuous layer of silver oxide. Applicants did not specify the presence of holes or discontinuities and should not be expected to add special language to confirm that a word or phrase has its ordinary meaning. One of ordinary skill in any art would expect qualifying wording ONLY when words or phrases do not have their usual meaning.

That the word "coating" clearly has its ordinary meaning is clearly borne out by paragraph 59: "The conclusion is that the bulk of the silver exists as silver (0) [that is, metallic silver] and that there is a surface coating which on average is a composition of silver (II) oxide [AgO]." This description is completely consistent with paragraph 7:

""small particles of silver which comprise an interior of metallic silver and an exterior of ionic silver . . ." No where in the specification is it stated or implied that the coating is discontinuous in any manner. Certainly if there were openings in the coating which revealed metallic silver, the statement "exterior of ionic silver" would make no sense whatsoever. Applicants respectfully contend that one of ordinary skill in the art would clearly appreciate that the invention includes particles wherein the interior of the particles is metallic and the exterior (i.e., the entire surface) is ionic silver—silver oxide. Although the precise wording "entire surface" does not appear in the specification, Applicants respectfully submit that one of ordinary skill in the art would understand that wording to be consistent with the description in the specification. In any case, the wording of the amended claim eschews this wording.

Current rejections

In the Office Action, the Examiner withdrew the claim rejections made under 35 USC § 103(a) based on U.S. Published Patent Application No. 2003/0054046 (now U.S. Patent No. 6,939,568) to Burrell et al. ("**Burrell**") including the rejection of claims 6-7 which had been rejected as being unpatentable over **Burrell** in view of Schonfeld et al. ("**Schonfeld**") (U.S. Patent No. 4,646,730). These rejections were replaced by modified rejections (discussed below) of claims 1-4, 8-10, 18-24 and 35 based on Yan et al. ("**Yan**") (Published U.S. Patent Application No. 20020051823) in view of Hanke et al. ("**Hanke**") (Published U.S. Patent Application No. 20020122832) and Hassegawa et al. ("**Hassegawa**") (U.S. Patent No. 4,983,385).

In addition, the Examiner raised provisional nonstatutory Double Patenting rejections of claims 1-4, 6-10, 18-24 and 35 as being unpatentable over claims 1-14 of U.S. Patent No. 7,135,195 in view of **Burrell**. In addition, claims 1-4, 6-10, 18-24 and 35 were provisionally rejected under obviousness-type double patenting as being unpatentable over claims 1-10 of copending U.S. Patent Application No. 11/813,408.

Applicants reiterate that when allowable material is identified in the instant application, a Terminal Disclaimer in the proper form to overcome the double patenting

rejections will be filed. Applicants respectfully submit that the rejection based on copending U.S. Patent Application No. 11/813,408 is not yet ripe for action.

Claim rejections under 35 USC § 103

Applicants respectfully contend that rejection of claims 1-4, 8-10, 18-24 and 35 under 35 USC § 103(a) as being non-patentable over U.S. Published Patent Application No 2002/0051823 by Yan et al. ("**Yan**") in view of U.S. Published Patent Application No. 2002/0122832 by Hanke et al. ("**Hanke**") and U.S. Patent No. 4,983,385 to Hasegawa et al. ("**Hasegawa**") fails for the same reasons discussed in regard to **Burrell** in the immediately previous amendment in this case. Whereas the present invention utilizes a suspension of nanoparticles having a silver core and a surface coated by silver oxide (the meaning of surface and coating are discussed above) suspended in water, the material of **Yan** consists of NAGs which are particles of ground up plant pith on which have been deposited silver particles prior to grinding the pith to form NAGs. Thus, one of ordinary skill would recognize that whereas the present invention comprises nanoparticles which are free to diffuse through the aqueous matrix of a hydrogel, the **Yan** invention provides particles (about 1-100nm in diameter) bound to larger granules of plant material and are thus not free to diffuse. In fact, the **Yan** specifically removes any free silver particles (see paragraph [0042]—thus, **Yan** teaches that free silver particles (as in the present invention) are not desirable. In addition, **Yan** does not carefully characterize the size of the pith-attached particles; the particles. Applicants reiterate their argument that the demonstrated effectiveness of the **Yan** particles is lower (i.e., takes much more silver to produce a given effect) than the silver of the instant invention.

Applicants respectfully contend that one of ordinary skill in the art would recognize that while the instant invention and the NAGs of **Yan** both contain particulate silver, they are not the same materials. The size distribution of the silver in **Yan** is not the same as the instant invention. Furthermore, **Yan** does not provide silver particles that are free in solution—the silver particles in NAGs are attached to much larger

particles of pith. One of ordinary skill in the art would also not expect the **Yan** particles to have a surface coating of ionic silver. Thus one of ordinary skill in the art would recognize that while the NAGs represent a useful product, that product has many differences from the silver particles of the present invention wherein the particles are freely suspended in an aqueous solution. In view of these differences, one of ordinary skill in the art would not expect NAGs to be effective in a viscous-solid hydrogel matrix where the bound silver particles on the NAGs would not be free to diffuse through the matrix. This expectation would be confirmed by the lack of hydrogel examples in **Yan.**

Applicants respectfully contend that the issue is not whether Applicants have demonstrated the criticality of the silver and the hydrogel form or whether the NAGs are effective at low concentrations. As the Examiner has pointed out, the question is whether a combination of **Yan, Hanke** and **Hasegawa** renders the present invention obvious to one of ordinary skill in the art. None of these references show that particulate silver is at all effective in an aqueous hydrogel matrix. **Hasegawa** teaches that a specific hydrogel containing ointment base both sticks to wet surfaces (e.g., mucous membranes) and effectively dispenses active ingredients to those surfaces. However, all of the active ingredients disclosed are soluble in the ointment. This solubility allows the active ingredients to freely diffuse through the matrix and be delivered to the mucous membrane or other surface to be treated. As explained above, **Yan** does not teach inclusion of NAGs in a hydrogel matrix, and because the **Yan** silver particles are bound to much larger organic particles, one of ordinary skill in the art would not and could not expect NAGs to deliver effective silver to a surface when embedded in a hydrogel matrix. Nor does **Hanke** correct this problem. That reference teaches the use of silver particles in a hydrophobic matrix. Use in a hydrogel is not demonstrated, but effectiveness (see paragraph [0040]) at 50 ppm and 250 ppm silver is reported. There is some effect at 50 ppm (already higher than the levels of silver in the present invention) but to get true killing (as demonstrated for low levels of silver in the present specification), one must use 250 ppm of silver. Applicants respectfully contend that one of ordinary skill in the art would simply conclude that the material of **Hanke** is

significantly less effective than that described in the current invention. This fact or conclusion does not in any way advance the obviousness case the Examiner has presented.

Finally, the Examiner attempts to negate the Applicants synergistic or unexpected results by requiring some sort of side by side comparison. Applicants respectfully question this requirement. Applicants were attempting to argue what one of ordinary skill in the art would conclude from the cited art. Applicants' attorney agrees that actual laboratory test might be required to proved which silver composition is most effective. However, when discussing obviousness, one is dealing with whether one of ordinary skill in the art would have perceived a reasonable probability of success in making a combination. As detailed in the specification, the remarks accompanying earlier amendments in this case and to some degree in the cited art, the field of silver particle antimicrobials is known to be unpredictable. There is a very wide variety of silver products and while it is known that silver ions show strong antimicrobial properties, the antimicrobial properties exhibited by silver particles vary widely and there is no clear consensus on what characteristics define or predict the most effective silver materials.

However, Applicants do wish to more clearly point out the synergistic effects of some of the claimed inventions. Applicants draw the Examiner's attention to the experiments demonstrating effectiveness against *Bacillus subtilis* spores beginning at paragraph [94] of the specification. It is well known to one of ordinary skill in the art of microbiology that endospores of bacterial such a *B. subtilis* are notoriously difficult to kill. Appended to this paper is a publication entitled "Binding of Small, Acid Soluble Spore Proteins to DNA plays a Significant Role in Resistance of *Bacillus subtilis* Spores to Hydrogen Peroxide" (Setlow and Setlow, Applied and Environmental Microbiology 59:3418-23 (1993)). It is respectfully submitted that one of ordinary skill in the art would be familiar with the teaching of this publication wherein it is clearly disclosed that endospores are very difficult to kill. This publication demonstrates (see Fig. 1) that kill of wild type spores is about 90% after 40 min exposure to 4 M (approximately 13.6%)

hydrogen peroxide. At 80 min exposure the kill rate is between 99% and 99.9%. Paragraph [22] of the instant specification shows that 22 ppm silver shows 98.8 percent kill at 240 min. Paragraph [122] shows that 14 ppm silver plus 1.5% hydrogen peroxide shows 99.1% kill at 120 min and 10 ppm silver plus 1.0% hydrogen peroxide shows 97% kill at 120 min. Applicants respectfully submit that these results show clear synergism between the inventive silver and hydrogen peroxide. The level of kill from the mixtures is higher than expected from either silver or hydrogen peroxide alone. The relative resistance of the spores to 4 M hydrogen peroxide (publication) indicates that 1.5% hydrogen peroxide alone would be expected to be ineffective.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested. If for any reason the Examiner still finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles telephone number (310) 229-9928 to discuss the steps necessary for placing the application in condition for allowance. You are hereby authorized to charge any fees due and refund any surplus fees to our Deposit Account No. 22-0261. Please reference matter number 80663.251821.

Respectfully submitted,

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Attachment: Binding of Small, Acid Soluble Spore Proteins to DNA plays a Significant Role in Resistance of Bacillus subtilis Spores to Hydrogen Peroxide. Applied and Environmental Microbiology 59:3418-23 (1993).